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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,365	12/30/2003	Kyung-Ju Choi	ZM921/05025	7814
27868	7590	11/27/2007	EXAMINER	
JOHN F. SALAZAR			DRODGE, JOSEPH W	
MIDDLETON & REUTLINGER			ART UNIT	
2500 BROWN & WILLIAMSON TOWER			PAPER NUMBER	
LOUISVILLE, KY 40202			1797	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/748,365	CHOI, KYUNG-JU	
	Examiner	Art Unit	
	Joseph W. Drodge	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 36-62 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 36-62 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The disclosure is objected to because of the following informalities: On page 2, the status of application 10/317,437 should be indicated as ", now Patent 7,097,684".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 36, 38, 39 and 59-61 are rejected under 35 U.S.C. 102(b) as being anticipated by Muller et al patent 4,954,255.

Regarding Claims 36 and 62, Muller discloses a pleated fluid filter arrangement comprising: at least one layer of flanks of filter media (#22,5) pleated into a plurality of longitudinally extending adjacent opposed successive pleat flanks (or face crests) of selected depth (*having sharp-nonwavy face crests, planar flanks and, in contrast, rounded small areas of curvature or waviness of pleat edges (column 5, lines 29-32), opposite the crests. Spacers 6 or 11/12, of material increments which are of a form that is dimensionally stable and hence of selected length (column 5, lines 59-60)*), provide spacing between successive pleat flanks (or face crests) 5 to provide spaced upstream and downstream filter face crests. The pleat flanks 5 are substantially planar, and *form flank planes*. In the embodiment of figure 9, the spacers are in

Art Unit: 1797

the form of facing increments that are nestled against the filter media surfaces (column 5, lines 9-20 and column 6, lines 44-58).

The top or fold edges, crests, of the pleat flanks together form a substantially single planar surface, the facing increments being adhered to the planar surfaces at points which are spaced from the pleat crests. The material increments are applied to the flank planes 5, and extend adjacently and centrally oriented with respect to an upstream-facing and downstream-facing flank plane (figures 2 and 6).

Regarding Claim 38, Muller discloses the communicatively facing increments of the spaced formed material increments being of selected thickness so that the distance between adjacent successive pleat planks and between the spaced upstream and downstream filter face crests is substantially equal (Figs. 2a-5d and especially figure 6).

Regarding Claim 39, Muller discloses the adjacent successive pleat flanks being of a substantially uniform level geometric configuration (Figs. 2a-5d).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muller in view of van Rossen patent 5,505,852 or Kahler of record.

Regarding Claim 37, teaches the increments of the spaced formed material increments being selected from a suitable fluid pliable adhesive (Col. 8, Lines 33-36). Van Rossen also teaches to utilize adhesive with spacers between pleat flanks to adhere spacers to the flanks (column 7, lines 6-18). It would have been obvious to one of ordinary skill in the art to have applied adhesive to the spacers of Muller, in view of van Rossen or Kahler, to more permanently secure the spacers to the flanks and thus resist filter deformation in use due to applied fluid pressures.

Claims 40-42, 48, 50-52, and 54-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller in view of Enborn of record or van Rossen and also in view of Cusick et al., U.S. Patent No. 5,993,501.

Regarding Claims 40 and 50, Enborn teaches a pleated filter with spacers and also teaches a support layer (#6) but does not disclose the material of the filter media. Van Rossen teaches a pleated filter of substantially planar, un-wavy features, with the filter media consisting of a support material layer and filter material layer that may be of fabric (see especially Abstract,

Art Unit: 1797

column 6, lines 3-47). Cusick teaches a pleated fluid filter comprising at least one layer of selected scrim material (#24, 26) serving as a support layer and a selected fine synthetic (Col. 2, Lines 48-60) filter media material (#22) applied to the selected scrim material. It would have been obvious to one of ordinary skill in the art to modify Muller with the support element of Enborn or van Rossen and also in view of Cusick, in order to maintain the shape of the filter layer against applied fluid pressures occurring during filtering operation and maintain high stability and shape, synthetic support layer materials being common in the filter art, with various materials being taught in columns 6-7 of van Rossen.

Regarding Claim 41, Cusick discloses that the scrim material is in the range of approximately forty to two hundred grams per square meter in basic weight (Col. 8, Lines 7-18) but does not disclose the fiber size, or stiffness of the scrim material. One of skill in the art would by routine experimentation find the optimum fiber size, and stiffness. It would have been obvious to one of skill in the art to make the fiber size, and stiffness of the scrim of Muller in view of Cusick as so desired or required, including as claimed to optimize filtration.

Art Unit: 1797

Regarding Claim 42, Cusick discloses that the scrim material includes with a selected hot melt spray (Col. 5, Lines 20-24) of adhesive amorphous material (Col. 6, Lines 28-52) and the filter media material is of a relatively estimated selected weight, fiber, thickness and porosity (Col. 5, Lines 12-20) when applied to the hot melt spray coating.

Regarding Claim 48, Cusick discloses that at least one layer of filter media is of synthetic fibrous material (Col. 2, Lines 48-60).

Regarding Claim 50, Cusick discloses that at least one selected scrim layer has been fed to a forming zone as a downstream support layer and a selected fine synthetic filter media material has been applied thereto (Col. 11, Lines 45-52).

Regarding Claim 51, Cusick discloses that downstream support layer includes synthetic material (Col. 7, Line 54 – Col. 8, Line 18).

Regarding Claim 52, Cusick discloses that the downstream support layer is of wet-laid material (Col. 8, Lines 7-13).

Regarding Claim 54, Muller in view of Cusick does not disclose that the downstream support layer is of dri-laid material. Determination of patentability in "product by process" claims is based on product itself. In re Thorpe, 227 USDQ 964 (1985). The support layer forming method of Kahler in view of Cusick is deemed to be a structure alternative to the dri-laid process.

Regarding Claim 55, Cusick discloses that the downstream support layer is of spunbond material (Col. 8, Lines 7-13).

Regarding Claim 56, Cusick discloses that the selected fine synthetic filter media is of meltblown material (Col. 6, Lines 5-9).

Claims 43-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller in view of Kahler of record.

Claims 43-46 differ from Muller in requiring the the communicatively facing increments of spacers to have differing cross-sections, lengths, or cross-section breadths (claims 43,45 and 46), or be overlapping (claim 44),

Regarding Claim 43, Kahler teaches that the communicatively facing increments being in the form of substantially similar length increment first and second sets with at least one of the sets having a substantially uniform cross-section with at least one certain select increment of the other set being of differing cross-section wherein at least one certain pair of communicatively facing increment is tapered to provide tapered spacing and a overall geometric configuration conducive to a select geometric configuration (Figs. 5a-5d).

Regarding Claim 44, Kahler teaches the communicatively facing formed material increments being in increment first and second sets with at least selected increments of at least one set overlapping with respect to selected pleat crests of the other set (Fig. 5d, material 16.1b' also functioning as spacing material).

Regarding Claim 45, Kahler teaches the communicatively facing formed material increments being in formed material increment first and second sets with at least selected formed material increments of one set differing in length from at least one of the lengths of other formed material increments in the sets (see especially Figs. 5c,5d).

Regarding Claim 46, Kahler teaches that the communicatively facing formed material increments being in formed material increment first and second sets with at least one of the

Art Unit: 1797

selected formed material increments of one set differing in cross-sectional breadth from a cross-sectional breadth of at least one of the other formed material increment of the other set (Figs 5a-5d).

It would have been obvious to have manufactured the spacers of Muller to have differing cross-sections, lengths, or cross-section breadths (claims 43,45 and 46), or be overlapping (claim 44), as taught by Kahler, so as to more evenly distribute fluid flow across the entire extent of the pleat flanks of the filter segments and mitigate uneven particle accumulations.

Claims 47 and 62 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as being unpatentable over Muller.

Regarding Claim 47, Muller does not disclose the communicatively facing formed material increments being pressure displaced increments (claim 47) or formed in a pleating zone with a back and forth reciprocating motion of a reciprocating mechanism. Determination of patentability in "product by process" claims is based on product itself. In re Thorpe, 227 USDQ 964 (1985). The increment formation process of Muller is deemed to form a pleated filtering structure by a process with is an equivalent alternative to the claimed pressure displacement process or reciprocating mechanism process, with no commensurate difference in end product.

Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muller in view of Enborn of record or van Rossen (newly cited) and also in view of Cusick et al as applied to Claim 48 above, and further in view of Niccum et al., U.S. Patent No. 3,849,314.

Regarding Claim 49, Muller in view of Enborn and Cusick does not disclose that the filter media is of cellulose material. Niccum teaches a pleated fluid filter comprising a cellulose filter media (Col. 2, Lines 53-56). It would have been obvious to one of ordinary skill in the art

Art Unit: 1797

to modify Muller in view of Cusick with the element of Niccum because it is a material of manufacture common in the filter art.

Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muller in view of Enborn and Cusick as applied to Claim 50 above, and further in view of Osendorf, U.S. Patent No. 5,427,597.

Regarding Claim 53, Muller in view of Enborn and Cusick does not disclose that the downstream support layer is of cellulose material. Osendorf teaches a pleated fluid filter comprising a cellulose support layer (Col. 3, Lines 1-3). It would have been obvious to one of ordinary skill in the art to modify Muller in view of Cusick with the element of Osendorf because it is a material of manufacture common in the filter art.

Claims 57-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller in view of Enborn and Cusick as applied to Claim 56 above, and further in view of Kenigsberg et al., U.S. Patent No. 5,156,780. Regarding Claims 57-58, Muller in view of Cusick does not disclose an additive being added to the filter media. Kenigsberg teaches a process for adding a fluoro chemical to a porous media (Col. 4, Lines 33-38). It would have been obvious to one of ordinary skill in the art to modify Muller with the element of Kenigsberg in order to achieve permanent water and oil repellency while maintaining the porosity of the filter (Col. 3, Lines 52-54).

Art Unit: 1797

Applicant's arguments filed on October 5, 2007 have been fully considered but they are not persuasive. It is argued that Muller fails to disclose pleat flanks that are manufactured to have minimal wave formation. Figures and text of Muller clearly show sharp, non-wavy crests contrasting with rounded, or wavy, bottoms of the pleats, or pleat flanks. Elements of Muller which are wavy, lattice element 27, wave troughs, wave-shaped inserts or spacer 10, etc. (column 6) are identified as such, the filtering pleats, folds (crests) are not identified as wavy.

It is argued that Muller does not have material increments of selected length oriented between filter face crests, or pleat flanks. The teachings of such spacer, material increments being dimensionally stable infers all dimensions, including length being of selected, stable value.

It is argued that only the corners of the material increments of Muller, not the length of the increments are applied to the flank planes. However, the instant claims merely state that the material increments are applied to the flank planes, per se, and do not require any particular length, much less the full extent of the increments being applied to the flank planes.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

Art Unit: 1797

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Drodge at telephone number 571-272-1140. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Roy Sample, can be reached at 571-272-1376. The fax phone number for the examining group where this application is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either private PAIR or Public PAIR, and through Private PAIR only for unpublished applications. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JWD

**/Joseph W. Drodge/
Primary Examiner, Art Unit 1797**

11/19/07